SEATTLE CITY LIGHT

MATERIAL STANDARD

STANDARD NUMBER: **2501.8**
PAGE: 1 of 4
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SWITCHGEAR, INTERRUPTER, METAL-ENCLOSED INDOOR, THREE-PHASE, 13.8 kV

1. General

1.1 This specification covers indoor, three-phase, 13.8 kV, metal-enclosed interrupter switchgear.

1.2 Each unit of switchgear shall be freestanding and self-supporting and shall contain a three-phase interrupter switch, power fuses, and accessory components, all completely factory assembled and tested. The complete assembly shall be integrally designed and produced by the manufacturer of the basic switching components and the manufacturer shall be solely responsible for the performance of the basic switch components as well as the complete integrated assembly as rated.

1.3 The metal-enclosed interrupter switchgear shall meet or exceed the applicable requirements of ANSI C37-20, IEEE Standard 27 and NEMA SG-5, latest revision, except as modified herein.

2. Service

2.1 This switchgear is intended for use on a 13,800-volt, three-phase, 60 Hertz network system. The load will consist of network-type transformer(s) with delta-connected primary and grounded wye-connected secondary. These transformers feed a secondary network through network protectors.

2.2 Primary cable entrance bushings shall be supplied and installed on the line side and the load side. The bushings shall be spaced a minimum of 8" apart in a horizontal line and welded to a plate which, in turn, is bolted to the switchgear. The bushings shall be rated 600 amperes and 125 kV BIL.

2.3 The bushings shall be Elastimold apparatus bushing K600TBC for in-air application. Other manufacturers' bushings may be acceptable provided they are the welded-in type; they are suitable for in-air operation; and certified test data are submitted showing that the bushings are interchangeable with Elastimold No. K650BLR elbow interfaces and have electrical ratings equal or better.

2.4 Each bushing shall have a cap to prevent the entrance of moisture or contamination during shipping and storage. The bushings shall be protected against damage during shipping and temporary storage with a wood or metal cover that is securely fastened to the metal switchgear enclosure.

2.5 The line side and load side entrance bushings shall be mounted on the back of the unit unless otherwise specified in the purchase requisition.

3. Ratings

3.1 The ratings for the integrated switchgear assembly shall be as follows:

Normal Voltage	13.8 kV
Maximum Design Voltage	15.0 kV
Basic Impulse Insulation Level (BIL)	95.0 kV
Continuous Current Rating	600 amperes
Load-Interrupting Current	600 amperes
Short-Circuit Ratings	25,000 amperes, RMS sym.
	600 MVA, 3-phase sym.
	at rated voltage
Duty Cycle, Fault Closing	40,000 amperes, RMS asym.

The momentary ratings of the integrated switchgear assembly shall be equal to or exceed the short-circuit ratings.

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3.2 The interrupter switches with power fuses shall have two-time, duty-cycle, fault-closing ratings equal to or exceeding the specified short-circuit rating of the integrated switchgear assembly. The manufacturer shall supply test data showing that the interrupter switches with power fuses shall have the capability to perform switching duties including interrupting cable-charging current and magnetizing current at rated voltage.

4. Fuse and Mountings

4.1 The fuses shall be S&C Electric Company SM-55, 450 opening disconnect style, vertically mounted with snuffler, S&C Electric Company Catalog Nos. 87442 and 86642, latest revisions.

4.2 Fuses shall be rated to interrupt 600 MVA, three-phase, symmetrical at rated voltage.

4.3 Each switchgear unit shall be furnished with three fuse refills plus three spare fuse refills mounted in a suitable holder on the inside of the access door. The ampere ratings will be specified in the purchase requisition.

5. Construction

5.1 The switchgear cabinet shall be constructed to provide adequate space, volume, and strength for fuse handling, fuse exhaust, and venting, and shall withstand all pressure buildup during interruption without permanent distortion or damage to any portion of the structure.

5.2 Inspection windows shall be provided in front of the interrupter switch. The switch contacts shall be visible through the windows.

5.3 Doors shall accommodate padlocking and shall be interlocked to prevent access to energized interrupter switches or power fuses and to prevent closing the interrupter switch when the door is open.

5.4 Each compartment containing high-voltage components shall be provided with a hinged, protective metal screen door, bolted closed.

5.5 Maintenance and personal access to the unit shall be through the front only. Maintenance on the terminators shall be through the front.

5.6 The enclosure ground connection shall consist of one unpainted copper-faced steel or stainless steel pad, 2" x 3-1/2" with two 1/2"-13NC tapped holes spaced 1-3/4" on centers. The pad shall be welded to the exterior of the enclosure on the back near the bottom. The threads shall be coated with an oxide-inhibiting compound.

5.7 Grounding Provisions

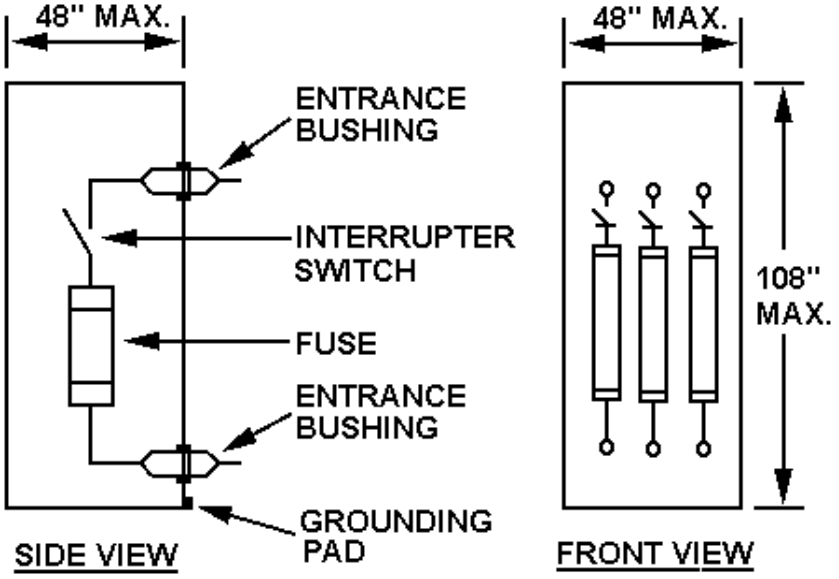
5.7.1 Accessible grounding provisions shall be installed at the lower terminal of each fuse mounting and at the ground bus.

5.7.2 Accessible grounding provisions shall be installed on the line side of the interrupter switch and at the ground bus.

5.7.3 **The grounding provisions shall be equal to the short-circuit rating of the switchgear.**

5.8 Louvers shall be provided at the top and bottom on the front and rear of each unit per ANSI C37-20, paragraph 6.4.1.

5.9 Maximum dimensions and cable entrance bushing mountings are as follows:



5.10 All steel surfaces to be painted shall receive a phosphatizing treatment or equivalent prior to application of paint. External and internal surfaces shall be coated with at least one coat of corrosion-resisting paint, Light Grey, ANSI Standard No. 61.

6 .Operation

The interrupter switches shall be group operated, and the interrupting action shall not liberate appreciable quantities of ionized gas. Interrupting units shall be mechanically operated by, and interlocked with, the interrupter switchblades so as not to open until the blades have cleared the main contacts by a distance greater than the external flashover distance across the interrupting unit. The interlock shall prevent operations of the interrupter because of incomplete opening or closing operations of the switch. Each interrupter switch shall be actuated through a built-in, nondefeatable, quick-make, quick-break mechanism to assure high-speed closing and opening independent of the speed of operation of manual-operating handle. Operating handles shall be externally mounted and non-removable, and shall provide for latching and padlocking in open and closed position. The operating handle shall swing in a vertical plane normal to front face of switchgear to minimize exposure to possible operating handle kickback.

7. Signs and Nameplates

7.1 All external doors and hinged bolted panels and all internal doors and screen doors shall be provided with "Danger - High Voltage" signs.

7.2 Each unit of switchgear shall be provided with nameplate indicating the following:

(a) Manufacturer's name and drawing number for the completed assembly.

(b) Voltage ratings.

(c) Continuous current rating.

(d)Short-circuit ratings.

(e) Momentary and fault-closing ratings.

(f) Interrupter switch rating.

(g) Maximum rating of power fuse in amperes.

(h) Manufacturer and catalog number of fuse refill units.

8. Data to be Supplied by Bidder

8.1 Each bidder shall submit with the proposal the data listed below. Product evaluation and conformance with specifications will be determined strictly on the basis of information submitted. The drawings and data furnished must be in sufficient detail and clarity to enable making a complete and positive check with the technical provisions of the specification.

(a) Outline drawings with overall dimensions.

(b) Information concerning details of construction.

(c) Information concerning details of operation.

(d) Total weight of unit.

(e) Test data as outlined in paragraph 3.2.

8.2 Certified test reports, if requested, shall be furnished for the following:

(a) Fuse capability of interrupting rated MVA at rated voltage within the switchgear unit showing that the structure will adequately withstand pressure buildup during interruption without permanent distortion or damage of any portion of the structure.

(b) Switch capability of interrupting full-load current at rated voltage.

(c) Switch capability of a two-time, duty-cycle fault closing at rated MVA.

9. Data to be Submitted by a Successful Bidder

The successful bidder shall supply the data listed below. The data shall be delivered to:

Seattle City Light
attention Network Distribution Engineering
Suite 3100
700 5th Avenue
Seattle, Washington 98104-5031.

(a) Three certified copies of all standard tests.

(b) Three copies of outline dimensions of the switchgear.

(c) Three copies of the nameplate drawing.

(d) Three copies of an instruction book covering the installation, operation, and maintenance of the equipment furnished.

(e) Three copies of a renewal/spare parts list (bushings, switch parts, etc.).

10. Guarantee

Any switchgear unit failing due to defective design, material, and/or workmanship within 12 months after being energized or 18 months after delivery shall be repaired or replaced without cost to the City of Seattle Light Department. Any defect in design, material, and/or construction discovered within this period shall be corrected on all units furnished on this order at the manufacturer's expense either by repair or replacement.

Reference Specifications: ANSI C37.20
IEEE Standard 27
NEMA SG-5